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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,986	09/23/2003	Lee Kong Weng	70030735-1	4231

57299 7590 12/31/2007

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EXAMINER	
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ART UNIT	PAPER NUMBER
2875	

NOTIFICATION DATE	DELIVERY MODE
12/31/2007	ELECTRONIC

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/669,986
Filing Date: September 23, 2003
Appellant(s): WENG ET AL.

Thomas Woods
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/4/07 appealing from the Office action mailed 7/6/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2002-232017	**Kyocera Corp.**	**8-2002**
5,686,790	**Curtin et al.**	**11-1997**
6,355,946	**Ishinaga**	**3-2002**
6,186,649	**Zou et al.**	**2-2001**
6,715,901	**Huang**	**4-2004**

Merriam-Webster's Collegiate Dictionary, Tenth Ed., p. 1288

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3, 5-6, 8-9, 11-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga (U.S. Patent 6,355,946) in view of Kyocera (JP 2002232017) and Curtin et al. (U.S. Patent 5,686,790).

Regarding claim 1, Ishinaga discloses a standalone light emitting diode package (abstract) comprising a housing comprising sidewalls (Fig. 1) and a substrate (reference number 1), the sidewalls and the substrate defining a cavity having a bottom (Fig. 1, see bottom portion of dotted lines), the substrate being located at the bottom of the cavity (Fig. 1, reference number 1), portions of the substrate engaging or being adjacent to the sidewalls (Fig. 2, see elliptical dotted line in the middle), the substrate being formed of ceramic (column 3, lines 50-55), at least one light-reflective metallic coating disposed over at least portions of the substrate (column 3, lines 65-68), a light emitting diode mounted on or in the substrate (abstract, Fig. 1), and optically transparent material disposed in the cavity and covering the light emitting diode (column 4, lines 25-30), wherein the ceramic composition of the substrate and the composition of the sidewalls and the light-reflective coating cooperate to minimize light leakage through or into the housing when the light emitting diode is energized (column 4, lines 55-65), the metallic coating reflects light incident thereon in a predetermined direction (column 3, lines 65-68, and Fig. 1), and the optically transparent material protects the light emitting diode (column 4, lines 25-30). Ishinaga does not disclose the metallic coating on the sidewalls and the vertical sidewalls being formed of one continuous and unitary piece of ceramic.

Kyocera discloses substantially vertical sidewalls (Fig. 4, reference number 33), the substantially vertical sidewalls being formed of ceramic (English abstract), and at least one light-reflective metallic coating disposed over at least portions of the sidewalls (Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of Kyocera in the apparatus of Ishinaga to make the apparatus produce more light. See the English abstract of Kyocera.

Curtin et al. discloses substantially vertical sidewalls (Fig. 7), the vertical sidewalls being contiguous, continuous and uninterrupted respecting one another at the intersections thereof (Fig. 7, reference number 701), the housing forming a single unitary piece of ceramic (reference number 701, Fig. 7), the housing minimizing light leakage through, into or out of the housing (Fig. 7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of Curtin et al. in the apparatus of Ishinaga to enable one to attach driver circuits to the substrate (column 3, line 55, to column 4, line 6, of Curtin et al.).

Regarding claims 3 and 9, Ishinaga discloses the cavity being substantially white in color (column 4, lines 30-35).

Concerning claims 5 and 11, Ishinaga discloses the metallic coating being comprising gold (column 3, lines 65-68, Fig. 1).

Regarding claims 6 and 12, Ishinaga discloses the metallic coating being formed by plating (column 3, lines 65-68).

Regarding claim 8, Ishinaga discloses a housing having sidewalls (Fig. 1) and a substrate (reference number 1), the sidewalls and the substrate defining a cavity having a bottom (Fig. 3, lower middle), the substrate being located at the bottom of the cavity (Fig. 1), portions of the substrate engaging or being adjacent to the sidewalls (Fig. 1), the substrate

being formed of ceramic (column 3, lines 50-55), at least one light-reflective metallic coating being disposed over at least portions of the substrate (column 3, lines 65-68, Fig. 1), a light emitting diode being mounted on or in the substrate (abstract, Fig. 1, reference number 3A), an optically transparent material being disposed in the cavity and covering the light emitting diode (column 4, lines 25-30), the ceramic composition of the substrate and the composition of the sidewalls and the light-reflective coating cooperating to minimize light leakage through or into the housing when the light emitting diode is energized (column 4, lines 55-65), the metallic coating reflecting light incident thereon in a predetermined direction (column 3, lines 65-68, and Fig. 1), and the optically transparent material protecting the light emitting diode (column 4, lines 25-30), the method comprising providing the housing (Fig. 1), coating at least portions of the substrate with a light-reflective metallic coating (column 3, lines 65-68), mounting the light emitting diode on or in the substrate (Fig. 1, abstract) and depositing the optically transparent material in the cavity (column 4, lines 25-30). Ishinaga does not disclose stamping the ceramic, the substantially vertical sidewalls being unitary with each other or with a metallic coating, or the step of coating the sidewalls with the at least one light-reflective metallic coating.

Kyocera discloses substantially vertical sidewalls (Fig. 4, reference number 33), the substantially vertical sidewalls being formed of ceramic (English abstract), at least one light-reflective metallic coating disposed over at least portions of the sidewalls (Fig. 4), and the step of coating the at least portions of the sidewalls with the at least one light-reflective metallic coating (Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of Kyocera in the apparatus of Ishinaga to make the apparatus produce more light. See the English abstract of Kyocera.

Curtin et al. discloses substantially vertical sidewalls (Fig. 7), the vertical sidewalls being contiguous, continuous and uninterrupted respecting one another at the intersections thereof (Fig. 7, reference number 701), the housing forming a single unitary piece of ceramic (reference number 701, Fig. 7), the housing minimizing light leakage through, into or out of the housing (Fig. 7), and the step of stamping the housing from the single unitary piece of ceramic (column 24, lines 10-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of Curtin et al. in the apparatus of Ishinaga to enable one to attach driver circuits to the substrate (column 3, line 55, to column 4, line 6, of Curtin et al.).

Concerning claim 14, Ishinaga discloses the step of depositing epoxy as the optically transparent material in the cavity (column 4, lines 25-30).

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga in view of Kyocera and Curtin et al. as applied to claims 1 and 8 above, and further in view of Zou et al. (U.S. Patent 6,186,649).

Concerning claims 4 and 10, Ishinaga, Kyocera and Curtin et al. do not disclose using silver as a reflective coating. Zou et al. discloses the metallic coating comprising silver (column 6, lines 10-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the silver coating of Zou et al. in the apparatus of Ishinaga, Kyocera and Curtin et al. to achieve "high output irradiance[.]" See column 1, lines 60-65, of Zou et al.

Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga in view of Kyocera and Curtin et al. as applied to claims 1 and 8 above, and further in view of Huang (U.S. Patent 6,715,901).

Regarding claims 7 and 13, Ishinaga, Kyocera and Curtin et al. do not disclose the cavity being formed (or configured) to contain a plurality of LEDs. Huang discloses the ceramic cavity being formed to contain a plurality of LEDs (column 4, lines 62-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of Huang in the apparatus of Ishinaga, Kyocera and Curtin et al. to increase light output per apparatus.

(10) Response to Argument

Appellant argues that claims 1, 3, 5, 6, 8, 9, 11, 12 and 14 are not obvious over Ishinaga in view of Kyocera and Curtin (page 39, Appellant's Brief of 10/4/07). More specifically, Appellant argues that none of the cited references show the following:

> "*a housing comprising substantially vertical sidewalls and a substrate formed form* [sic] *a single unitary piece of ceramic*[;] * * * *at least one light-reflective metallic coating disposed over at least portions of the sidewalls and the substrate*[;] * * * *a housing forming a single unitary piece of ceramic* [;] * * * *a ceramic composition and configuration of a housing and a tight-reflective coating that cooperate to minimize light leakage through or into the housing when a light emitting diode is energized.*
>
> (Page 44, Appellant's Brief dated 10/4/07, emphasis in the original.)

To the contrary, these elements are shown in the combination of Ishinaga, Kyocera and Curtin. The housing with vertical sidewalls is disclosed by Ishinaga (see Fig. 3 on the right and

left reprinted by the Appellant on page 23 of the Appellants Brief of 10/4/07). The light reflective metallic coating disposed over at least portions of the sidewalls is admitted by Appellant on page 24 of the Appeal Brief dated 10/4/07. Ishinaga discloses the conductive traces on the base (column 3, lines 65-68). (The portions of the base with the conductive traces is a portion of the base with a metallic coating, because the conductive traces also reflect light; even a small portion of a metallic coating is a metallic coating that reflects light.) Nothing in the claim requires that the metallic coating cover most of the base. Furthermore, nothing teaches against substantially vertical sidewalls in Kyocera. Drawing 4 may be designated as prior art and not as advantageous as the invention ultimately described in Kyocera. However, a reference is not teaching against something just because it says that it is disadvantageous or otherwise not as good as the invention featured in the document. A reference must specifically teach one reading the reference that some certain thing should not be done, not that something is just not as good. See MPEP 2123 and 2145 (X)(D) (1).

The housing forming a single unitary piece of ceramic is disclosed in Curtin on Fig. 7 as reprinted by the Appellant on page 32 of the Appeal Brief dated 10/4/07. Appellant contends that the fact that the ceramic is in layers means that the structure is not unitary. To the contrary, nothing in the definition of unitary means that the base and sidewalls have to be solid ceramic. One of the definitions of the word "unitary" states as follows: "based on or characterized by unity or units" (*Merriam-Webster's Collegiate Dictionary,* Tenth Edition, page 1288). The layers are laminated and formed to make a unit as shown in Fig. 7 of Curtin. Thus, the element of the claim is met and the rejections should be upheld.

As to the last point, Ishinaga discloses the housing and coating cooperating to minimize light leakage in Fig. 3 as reproduced by Appellant on page 23 of the Appeal Brief dated 10/4/07. Any structure cooperates to minimize light leakage just by blocking some of the light. Nothing in

the claim specifies how much light leakage is prevented or gives any figures on the efficiency of the apparatus. Therefore, this element of the claim is met. Thus, it is respectfully submitted that the rejections should be upheld.

Appellant goes to a lot of trouble to say that the references should not be combined because no teaching or suggestion exists in the references themselves to make the combination. To the contrary *KSR v. Teleflex* indicates that the Teaching, Suggestion, Motivation Test is just one of many tests for motivation that can be used (82 USPQ2d 1385, 1396 (US 2007)). Furthermore, most of the motivations stated in the rejections come from the references themselves or the English abstracts of the references, which means that they meet the Teaching, Suggestion, Motivation Test. The motivation to use Huang comes from knowledge available to one of ordinary skill in the art, which is also allowed by *KSR v. Teleflex*. *Id.*

Since the motivations disclosed in the rejections meet the standards put forth by *KSR v. Teleflex*, the Appellant cannot say that impermissible hindsight reasoning is present. It must also be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the Appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case the motivations only take into account knowledge available to a person of ordinary skill in the art, and the combinations should be considered permissible.

Regarding Appellant's argument on page 48 of the Appeal Brief dated 10/4/07 about the economic infeasibility of the combination of the cited references is not pertinent to the

determination of whether or not the claims are allowable. See MPEP 2145 (VII). Thus, this argument is irrelevant and should not be considered.

The arguments concerning Zou et al. and Huang stand or fall with the arguments above, which are not accepted for the reasons delineated above. Thus, it is respectfully submitted that the rejections using these references should be upheld as well.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Sharon E. Payne

Sharon Payne

SHARON E. PAYNE
PRIMARY EXAMINER

Conferees:

Sandra O'Shea

Drew Dunn

Notes:
1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

Translated: 23:36:08 JST 12/20/2007
Dictionary: Last updated 12/14/2007 / Priority:

FULL CONTENTS

[Claim(s)]

[Claim 1] [the upper surface of the abbreviation plate-like ceramic base which has a loading part for carrying a light emitting element in the upper surface] Are the ceramic window frame which has a penetration hole for accommodating said light emitting element the package for light emitting element storage to laminate, and [said inner wall of the through hole] The package for light emitting element storage whose reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and said light emitting element emits light on the surface while having spread outside at the angle of 55 to 70 degrees to said ceramic base upper surface is characterized by putting 80% or more of metal layer.

[Claim 2] The process for which the ceramic green sheet for ceramic bases and the ceramic green sheet for ceramic window frames are prepared, Next, the process punched so that the inner wall of this penetration hole may become a ceramic green sheet for said ceramic window frames with the slope of 55 to 70 degrees about the penetration hole for light emitting element storage, Next, the process which applies a meta-RAIZU paste to said inner wall of the through hole, Next, while the inner wall of said penetration hole pastes up the ceramic green sheet for said ceramic bases, and the ceramic green sheet for said ceramic window frames on the direction which spreads outside The process which obtains the sintered compact by which the meta-RAIZU metal layer was put on said inner wall of the through hole while the lamination unification of the ceramic window frame which calcinates these and has a penetration hole for light emitting element storage on a ceramic base is carried out, Next, the manufacture method of the package for light emitting element storage that reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on said meta-RAIZU metal layer surface is characterized by providing the process on which 80% or more of plating metal layer is made to put.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the package for light emitting element storage for accommodating light emitting elements, such as a light emitting diode.

[0002]

[Description of the Prior Art] The package for light emitting element storage made from ceramics is used as a package for light emitting element storage for accommodating light emitting elements, such as a light emitting diode, conventionally.

[0003] [the package for light emitting element storage made from the conventional ceramics] In drawing 4 , as shown in a sectional view, it has the loading part 31a for carrying the light emitting element 35 in the upper surface central part. The abbreviation square plate-like ceramic base 31 which has a pair of meta-RAIZU wiring conductors 32 derived from this loading part 31a and its circumference on the undersurface, This ceramic base 31 upper surface laminates, and it consists of ceramic window frames 33 of the shape of an abbreviation square frame which has the penetration hole 33a for accommodating the light emitting element 35 in the central part. While adhering the light emitting element 35 to one side of the meta-RAIZU wiring conductor 32 drawn on the loading part 31a of the ceramic base 31 through a conductive jointing material, connect electrically through the bonding wire 36, and the electrode of the light emitting element 35, and the meta-RAIZU wiring conductor 32 of another side After an appropriate time, It becomes luminescence equipment by being filled up with the transparent closure resin which is not illustrated in the penetration hole 33a of the ceramic window frame 33, and closing a light emitting element.

[0004] In addition, it sets in such a package for light emitting element storage made from ceramics. In order to reflect the light in which the light emitting element accommodated in an inside emits light in the penetration hole 33a and to make luminous efficiency of luminescence equipment good, the meta-RAIZU metal layer 34 which has a nickel plating layer and a gilding layer on the surface is made to put on the inner wall of the penetration hole 33a.

[0005] [moreover, such a package for light emitting element storage] It is manufactured by the ceramic green sheet laminating method, and specifically While preparing the ceramic green sheet for ceramic base 31, and the ceramic green sheet for ceramic window frame 33 the penetration hole for accommodating the penetration hole and the light emitting element 35 for making these ceramic green sheets draw the wiring conductor 32 -- abbreviation -- [it pierces perpendicularly and] Next, from the upper surface of the ceramic green sheet for ceramic base 31 to the undersurface [the meta-RAIZU paste for meta-RAIZU wiring conductor 32] While adopting the method of screen-stenciling well-known etc. as the inner wall of the through hole of the ceramic green sheet for ceramic window frame 33 conventionally, respectively and applying the meta-RAIZU paste for meta-RAIZU metal layer 34 to it The ceramic green sheet for ceramic base 31 and the ceramic green sheet for ceramic window frames are pasted up in piles up and down. Next, after calcinating these at high temperature and making with a sintered compact, it is manufactured by making the plating metal layer which consists of metal, such as nickel, and gold, palladium, platinum, put on the exposure surface of the meta-RAIZU wiring conductor 32 and the meta-RAIZU metal layer 34 by the non-electrolyzed plating method or the electrolysis plating method.

[0006]

[Problem to be solved by the invention] however -- according to this conventional package for light emitting element storage, the inner wall of the penetration hole 33a receives the upper surface of the ceramic base 31 -- abbreviation -- [it is perpendicular, therefore] The light reflected with the inner wall of the penetration hole 33a was not emitted outside uniformly and good, but had the problem that the luminous efficiency of the

luminescence equipment using this package did not become so high.

[0007] This invention is thought out in view of this conventional problem, and [the purpose] It is in offering the package for light emitting element storage which reflective distribution of the light in which a light emitting element emits light is carried out good with the inner wall of the penetration hole for accommodating this light emitting element, and it emits outside uniformly and efficiently and can make luminous efficiency of luminescence equipment very high by that cause.

[0008]

[Means for solving problem] [the package for light emitting element storage of this invention / the upper surface of the abbreviation plate-like ceramic base which has a loading part for carrying a light emitting element in the upper surface] Are the ceramic window frame which has a penetration hole for accommodating a light emitting element the package for light emitting element storage to laminate, and [the inner wall of the through hole of a ceramic window frame] While having spread outside at the angle of 55 to 70 degrees to the ceramic base upper surface, reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on the surface is characterized by putting 80% or more of metal layer.

[0009] [moreover, the manufacture method of the package for light emitting element storage of this invention] The process for which the ceramic green sheet for ceramic bases and the ceramic green sheet for ceramic window frames are prepared, The penetration hole for light emitting element storage to the ceramic green sheet for ceramic window frames Next, among those, the process punched so that a wall may serve as a slope of 55 to 70 degrees, Next, the process which applies a meta-RAIZU paste to the inner wall of the through hole for ceramic window frames, Next, while the inner wall of the penetration hole of the ceramic green sheet for ceramic window frames pastes up the ceramic green sheet for ceramic bases, and the ceramic green sheet for ceramic window frames on the direction which spreads outside The process which obtains the sintered compact by which the meta-RAIZU metal layer was put on the inner wall of the through hole for light emitting element storage while the lamination unification of the ceramic window frame which calcinates these and has a penetration hole for light emitting element storage on a ceramic base is carried out, Next, reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on the meta-RAIZU metal layer surface of the inner wall of the through hole for light emitting element storage is characterized by providing the process on which 80% or more of plating metal layer is made to put.

[0010] While the inner wall of the penetration hole for accommodating a light emitting element has spread outside at the angle of 55 to 70 degrees to the upper surface of a ceramic base according to the package for light emitting element storage of this invention [the reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on the surface of this inner wall / put / 80% or more of metal layer] Reflective distribution of the light in which the light emitting element accommodated in a penetration hole emits light can be carried out good by the metal layer of the inclined inner wall of the through hole, and it can emit uniformly and efficiently toward the exterior.

[0011] Moreover, according to the manufacture method of the package for light emitting element storage of this invention, it punches so that the inner wall may become a ceramic green sheet for ceramic window frames with the slope of 55 to 70 degrees about the penetration hole for light emitting element storage. Next,

a meta-RAIZU paste is applied to the inner wall of the through hole for these ceramic window frames. Next, while the inner wall of the penetration hole of the ceramic green sheet for ceramic window frames pastes up the ceramic green sheet for these ceramic window frames, and the ceramic green sheet for ceramic bases on the direction which spreads outside The sintered compact by which the meta-RAIZU metal layer was put on the inner wall of the through hole for light emitting element storage while the lamination unification of the ceramic window frame which calcinates these and has a penetration hole for light emitting element storage on a ceramic base was carried out is obtained. next, [make / the reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on the meta-RAIZU metal layer surface of the inner wall of the through hole for light emitting element storage / 80% or more of plating metal layer / put] The package for light emitting element storage which reflective distribution of the light in which the light emitting element accommodated in a penetration hole emits light is carried out good by the plating metal layer of the inclined inner wall of the through hole, and can be emitted uniformly and efficiently toward the exterior can be offered.

[0012]

[Mode for carrying out the invention] Next, it explains in detail based on the Drawings of attachment of the package for light emitting element storage of this invention. Drawing 1 is the sectional view showing an example of the embodiment of the package for light emitting element storage of this invention, 1 is a ceramic base, 2 is a ceramic window frame, and the package for light emitting element storage of this invention for accommodating the light emitting element 3 mainly by these is constituted.

[0013] The ceramic base 1 is an abbreviation square plate which consists, for example of ceramic material, such as a nature sintered compact of an aluminum oxide, and a nature sintered compact of alumimium nitride, a nature sintered compact of MURAITO, glass ceramics. It functions as a base material for supporting the light emitting element 3, and has the loading part 1a for carrying the light emitting element 3 in the upper surface.

[0014] Moreover, covering formation of the meta-RAIZU wiring conductor 4b derived from the circumference of the meta-RAIZU wiring conductor 4a derived covering the ceramic base 1 over the undersurface from the loading part 1a and the loading part 1a to the undersurface is carried out. Meta-RAIZU wiring conductor 4a and 4b consist of metallic powder meta-RAIZU, such as tungsten, and molybdenum, copper, silver, and functions as an electric conduction way for connecting electrically outside the light emitting element 3 accommodated in the inside of a package. and While the light emitting elements 3, such as a light emitting diode, adhere to the loading part 1a part of the meta-RAIZU wiring conductor 4a with conductive jointing materials, such as a golden-silicon alloy and a silver-epoxy resin The electrode of the light emitting element 3 is electrically connected to the loading part 1a circumference part of the meta-RAIZU wiring conductor 4b through the bonding wire 5.

[0015] In addition, if a thickness of about 1-20 micrometers is made to put the metal which is excellent in the corrosion resistance of nickel, gold, etc. on the surface which meta-RAIZU wiring conductor 4a and 4b expose While being able to prevent effectively that meta-RAIZU wiring conductor 4a and 4b carry out oxidization corrosion, junction to the meta-RAIZU wiring conductor 4a and the light emitting element 3 and junction on the meta-RAIZU wiring conductor 4b and the bonding wire 5 can be made firm. Therefore, if it is usual, the about 1-10 micrometers nickel plating layer and the about 0.1-3-micrometer gold plate layer are

put on the exposure surface of meta-RAIZU wiring conductor 4a and 4b one by one by the electrolysis plating method or the non-electrolyzed plating method.

[0016] On the other hand, the ceramic window frame 2 consists of the ceramic material of the same composition substantially with the ceramic base 1, it is laminated by the ceramic base 1 upper surface, and sintering unification is carried out. The ceramic window frame 2 has the penetration hole 2a of the approximate circle form for accommodating the light emitting element 3 in that central part, or an abbreviation quadrangle, and the light emitting element 3 carried in this penetration hole 2a at the loading part 1a is accommodated.

[0017] Moreover, the metal layer 6 which is made to cover plating metal layers, such as nickel and gold, and changes on the meta-RAIZU metal layer which consists of metallic powder meta-RAIZU, such as tungsten, and molybdenum, copper, silver, is put on the inner wall of the penetration hole 2a of the ceramic window frame 2 all over abbreviation. And the plating metal layer in this metal layer 6 functions as reflective material which carries out reflective distribution of the light in which the light emitting element 3 accommodated in the inside of penetration hole 2a emits light.

[0018] In addition, it sets in the package for light emitting element storage of this invention. It is formed so that the wall in the penetration hole 2a of the ceramic window frame 2 may spread outside at the angle theta of 55 to 70 degrees to the upper surface of the ceramic base 1. As for the plating metal layer of the metal layer 6 surface put on the inner wall of this penetration hole 2a, the reflectance to the light in which the light emitting element 3 by which that center line average coarseness Ra is 1-3 micrometers, and is further accommodated in the penetration hole 2a emits light is 80% or more. Thus, it is formed so that the wall in the penetration hole 2a of the ceramic window frame 2 may spread outside at the angle theta of 55 to 70 degrees to the upper surface of the ceramic base 1. When the reflectance to the light in which the light emitting element 3 which the center line average coarseness of the plating metal layer of the metal layer 6 surface put on the inner wall of this penetration hole 2a is 1-3 micrometers, and is accommodated in the penetration hole 2a emits light is 80% or more Reflective distribution of the light in which the light emitting element 3 accommodated in the penetration hole 2a emits light is carried out good on the metal layer 6 surface of the wall in the inclined penetration hole 2a, it can emit uniformly and good to the exterior, and luminous efficiency of the luminescence equipment which uses this package can be made very high.

[0019] In addition, it is in the tendency which becomes difficult that the inner wall of the penetration hole 2a of the ceramic window frame 2 reflects the light in which the light emitting element 3 which will be accommodated in the penetration hole 2a if the upper surface of the ceramic base 1 and the angle theta to make exceed 70 degrees emits light good to the exterior. It is in the tendency for stability and forming efficiently to become difficult at such an angle about the inner wall of the penetration hole 2a for the another side angle theta to be less than 55 degrees. Therefore, the angle theta which the wall in the penetration hole 2a of the ceramic window frame 2 makes with the upper surface of the ceramic base 1 is specified as the range of 55 to 70 degrees.

[0020] [moreover, the plating metal layer of the metal layer 6 surface put on the inner wall of the penetration hole 2a] If it is in the tendency deviation becomes easy to generate in the strength of the light to reflect, without the ability carrying out reflective distribution of the light in which the light emitting element 3 accommodated in the penetration hole 2a as the center line average coarseness Ra is less than 1

micrometer emits light uniformly and 3 micrometers of another side is exceeded Stability and forming efficiently are in the tendency which becomes difficult about such a coarse field. Therefore, the center line average coarseness Ra of the plating metal layer of the metal layer 6 surface put on the inner wall of the penetration hole 2a is specified as the range of 1-3 micrometers.

[0021] Furthermore, the plating metal layer of the metal layer 6 surface put on the inner wall of the penetration hole 2a has reflected the light in which the light emitting element 3 accommodated in the penetration hole 2a as the reflectance to the light in which the light emitting element 3 accommodated in the penetration hole 2a emits light is less than 80% emits light good in the tendency which becomes difficult. Therefore, the reflectance to the light in which the light emitting element 3 by which the plating metal layer of the metal layer 6 surface put on the inner wall of the penetration hole 2a is accommodated in the penetration hole 2a emits light is specified to 80% or more.

[0022] Moreover, if the form is used as the approximate circle form, the penetration hole 2a can reflect uniformly the light in which the light emitting element 3 accommodated in the penetration hole 2a emits light in all the directions with the wall in the penetration hole 2a of an approximate circle form, and can be emitted outside very uniformly. Therefore, as for the penetration hole 2a, what the form is used as the approximate circle form for is desirable.

[0023] According to the package for light emitting element storage of this invention, in this way, while carrying the light emitting element 3 in the meta-RAIZU wiring conductor 4a on the loading part 1a of the ceramic base 1, connect electrically through the bonding wire 5, and the electrode of a light emitting element, and the meta-RAIZU wiring conductor 4b After an appropriate time, It becomes luminescence equipment by being filled up with transparent closure resin in the penetration hole 2a in which the light emitting element 3 was accommodated, and closing the light emitting element 3.

[0024] Next, the manufacture method of the package for light emitting element storage of this invention is explained based on attached Drawings. Drawing 2 (a) - (d) is the sectional view for every process showing the manufacture method of manufacturing the package for light emitting element storage shown in drawing 1 .

[0025] First, as shown in drawing 2 (a), the ceramic green sheet 11 for ceramic base 1 and the ceramic green sheet 12 for ceramic window frame 2 are prepared.

[0026] [such a ceramic green sheet 11-12] For example, if it is the case where the ceramic base 1 and the ceramic window frame 2 consist of the nature sintered compact of an aluminum oxide While carrying out addition mixture of an organic binder suitable in the end of ceramic precursor powder, a solvent, a plasticizer, dispersing agents, etc., such as an aluminum oxide, a silicon oxide, a calcium oxide, and magnesium oxide, and making with the shape of **** It is manufactured by adopting sheet forming technology, such as the well-known doctor blade method, and making this into the shape of a given thickness Mino sheet.

[0027] Next, as shown in drawing 2 (b), while piercing the penetration hole 11a which becomes the ceramic green sheet 11 for ceramic base 1 with the derivation way for making the undersurface draw meta-RAIZU wiring conductor 4a and 4b from the upper surface of the ceramic base 1 and piercing using a metallic mold The penetration hole 12a for the penetration holes 2a is pierced to the ceramic green sheet 12 for ceramic window frame 2, and it pierces using a metallic mold.

[0028] At this time, it forms so that the inner wall of the penetration hole 12a formed in the ceramic green sheet 12 for ceramic window frame 2 may spread at the angle theta of 55 to 70 degrees towards the principal surface of another side from one principal surface of the ceramic green sheet 12. Thus, by forming so that the inner wall of the penetration hole 12a may spread at the angle theta of 55 to 70 degrees towards the principal surface of another side from one principal surface of the ceramic green sheet 12 It can form so that the wall in the penetration hole 2a of the ceramic window frame 2 may spread outside at the angle theta of 55 to 70 degrees to the upper surface of the ceramic base 1.

[0029] Thus, in order to form so that the inner wall of the penetration hole 12a may spread at the angle theta of 55 to 70 degrees towards the principal surface of another side from one principal surface of the ceramic green sheet 12 What is necessary is just to set up widely the clearance C between punch 21 and dice 22 of a punch metallic mold, as shown in the sectional view for explaining how piercing the penetration hole 12 to drawing 3 . For example, what is necessary is for the clearance C of a metallic mold just to be about 0.2-0.5mm, if it is the case where the thickness of the ceramic green sheet 12 is about 0.5mm. An angle theta can be made into 55 to 70 degrees by doing so. In addition, it is in the tendency for stability and forming efficiently to become difficult at such an angle theta about the inner wall of the penetration hole 12a for an angle theta to be less than 55 degrees.

[0030] Moreover, it becomes what has the very big degree of rough of the inner wall of the penetration hole 12a by setting up the clearance C of a punch metallic mold widely in this way, and piercing the ceramic green sheet 12. And the center line average coarseness Ra of the wall in the penetration hole 2a of the package for light emitting element storage obtained by this becomes the very coarse thing which is about 4-10 micrometers, and becomes possible [making / about 1-3-micrometer / coarse the center line average coarseness Ra of the metal layer 6 put on the wall in this penetration hole 2a by that cause].

[0031] Next, as shown in drawing 2 (c), while adopting the screen-stenciling method for meta-RAIZU paste 14a and 14b meta-RAIZU wiring conductor 4a and for 4b in the up-and-down side of the ceramic green sheet 11 for ceramic base 1, and the penetration hole 11a and carrying out a printing application at a predetermined pattern Similarly the screen-stenciling method is adopted as the wall in the penetration hole 12a of the ceramic green sheet 12 for ceramic window frame 2, and the printing application of the meta-RAIZU paste 16 for metal layer 6 is carried out at it. In addition, when applying meta-RAIZU paste 14a and 14b, and 16 to the inner wall of the inside of the penetration hole 11a, or the penetration hole 12a, the method of printing, while attracting meta-RAIZU paste 14a and 14b, and 16 from the opposite side of a printing surface is adopted. At this time, while making viscosity of the meta-RAIZU paste 16 into about 30-200 Pa-S, it becomes possible by printing so that thickness may be set to about 10-25 micrometers for the center line average coarseness Ra of the metal layer 6 surface of the package for light emitting element storage to be about 1-3 micrometers.

[0032] Next, as shown in drawing 2 (d), the inner wall of the penetration hole 12a pastes up the ceramic green sheet 12 for ceramic window frame 2 on the direction which spreads outside to the upper surface of the ceramic green sheet 11 on the upper surface of the ceramic green sheet 11 for ceramic base 1.

[adhesion] while such adhesion applies to the undersurface of the ceramic green sheet 12 the adhesives containing an organic binder and a solvent The method of sticking by pressure by the pressure of 2 - 6MPa, while heating at the temperature of about 40-60 degrees C is adopted [these] as the upper surface of the

ceramic green sheet 11 in piles in this ceramic green sheet 12.

[0033] And while the ceramic base 1 and the ceramic window frame 2 obtain the sintered compact by which sintering unification was carried out by calcinating the meta-RAIZU paste 14-16 applied to the ceramic green sheet 11-12 and these which were laminated at the end at high temperature The package for light emitting element storage shown in drawing 1 is completed by making the exposure side of the conductive part of this sintered compact put plating metal layers, such as nickel, and gold, platinum, palladium, by the electrolysis plating method or the non-electrolyzed plating method.

[0034] In addition, at this time, the metal layer 6 makes reflectance of the plating metal layer to the light in which the light emitting element 3 emits light 80% or more while setting the center line average coarseness Ra on the plating metal layer of that surface to 1-3 micrometers. While the center line average coarseness Ra of the plating metal layer of the metal layer 6 surface shall be 1-3 micrometers, in order to make into 80% or more reflectance of the plating metal layer to the light in which the light emitting element 3 emits light What is necessary is just to make a 1-13-micrometer-thick plating metal layer put on the surface of this meta-RAIZU metal layer, while the center line average coarseness Ra of the meta-RAIZU metal layer in the metal layer 6 shall be 3-6 micrometers.

[0035] [according to the package for light emitting element storage of this invention] in this way While the inner wall of the penetration hole 2a for accommodating the light emitting element 3 has spread outside at the angle of 55 to 70 degrees to the upper surface of the ceramic base 1 The reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and the light emitting element 3 emits light on the surface of this inner wall can obtain the package for light emitting element storage of this invention on which 80% or more of metal layer was put.

[0036] In addition, this invention is not limited to the example of a form of above-mentioned operation, and it cannot be overemphasized that various change is possible.

[0037]

[Effect of the Invention] While the inner wall of the penetration hole for accommodating a light emitting element has spread outside at the angle of 55 to 70 degrees to the upper surface of a ceramic base according to the package for light emitting element storage of this invention [the reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on the surface of this inner wall / cover / 80% or more of metal layer] Reflective distribution of the light in which the light emitting element accommodated in a penetration hole emits light can be carried out good by the metal layer of the inclined inner wall of the through hole, and it can emit uniformly and efficiently toward the exterior. Therefore, luminous efficiency of the luminescence equipment using this package for light emitting element storage can be made very high.

[0038] Moreover, according to the manufacture method of the package for light emitting element storage of this invention, it punches so that the inner wall may become a ceramic green sheet for ceramic window frames with the slope of 55 to 70 degrees about the penetration hole for light emitting element storage. Next, a meta-RAIZU paste is applied to the inner wall of the through hole for these ceramic window frames. Next, while the inner wall of the penetration hole of the ceramic green sheet for ceramic window frames pastes up the ceramic green sheet for these ceramic window frames, and the ceramic green sheet for ceramic bases on the direction which spreads outside The sintered compact by which the meta-RAIZU metal layer was put

on the inner wall of the through hole for light emitting element storage while the lamination unification of the ceramic window frame which calcinates these and has a penetration hole for light emitting element storage on a ceramic base was carried out is obtained. next, [make / the reflectance to the light to which the center line average coarseness Ra is 1-3 micrometers, and a light emitting element emits light on the meta-RAIZU metal layer surface of the inner wall of the through hole for light emitting element storage / 80% or more of plating metal layer / put] The package for light emitting element storage which reflective distribution of the light in which the light emitting element accommodated in a penetration hole emits light is carried out good by the plating metal layer of the inclined inner wall of the through hole, and can be emitted uniformly and efficiently toward the exterior can be offered.

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view showing an example of the form of implementation of the package for light emitting element storage of this invention.

[Drawing 2] It is a sectional view for every process for explaining the manufacture method of this invention for manufacturing the package for light emitting element storage shown in drawing 1 .

[Drawing 3] It is the sectional view showing how to pierce the ceramic green sheet in the manufacture method of this invention.

[Drawing 4] It is the sectional view of the conventional package for light emitting element storage.

[Explanations of letters or numerals]

1 .... Ceramic base

1a ... Loading part

2 .... Ceramic window frame

2a ... Penetration hole for accommodating the light emitting element 3

3 .... Light emitting element

6 .... Metal layer

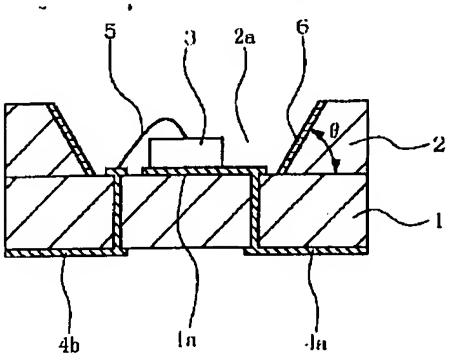
11 .... Ceramic green sheet for ceramic base 1

12 .... Ceramic green sheet for ceramic window frame 2

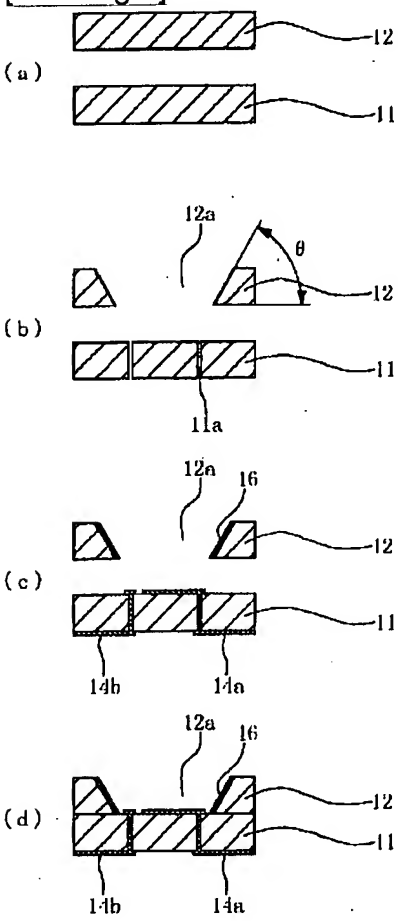
12a ... Penetration hole for the penetration holes 2a

16 .... Meta-RAIZU paste

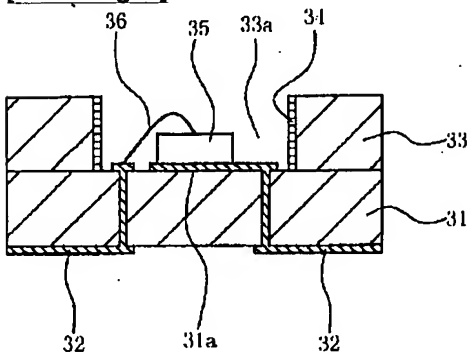
[Drawing 1]



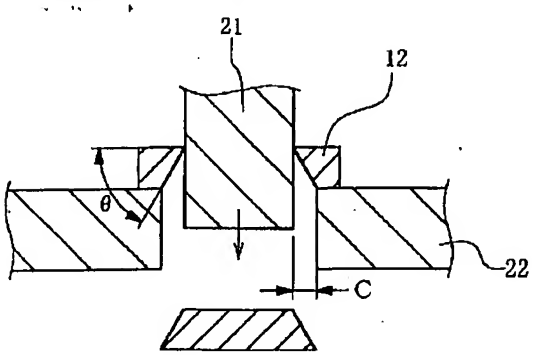
[Drawing 2]



[Drawing 4]



[Drawing 3]



[Translation done.]

un·il·lu·sioned \ˌən-i-'lü-zhənd\ *adj* (1926) : free from illusion
uni·loc·u·lar \ˌyü-ni-'lä-kyə-lər\ *adj* (1753) : containing a single cavity
un·imag·in·able \ˌən-ə-'maj-nə-bəl, -'ma-jə-\ *adj* (1611) : not imaginable or comprehensible — **un·imag·in·ably** \-blē\ *adv*
un·im·peach·able \ˌən-im-'pē-chə-bəl\ *adj* (1784) : not impeachable : not to be called in question : not liable to accusation : IRREPROACHABLE, BLAMELESS — **un·im·peach·ably** \-blē\ *adv*
[1]**un·im·proved** \-'prüvd\ *adj* (1602) *obs* : not reproved or admonished
[2]**unimproved** *adj* (1665) : not improved: as **a** : not tilled, built on, or otherwise improved for use ⟨∼ land⟩ **b** : not used or employed advantageously ⟨wasted time and ∼ opportunities⟩ **c** : not selectively bred for better quality or productiveness
un·in·hib·it·ed \ˌən-in-'hi-bə-təd\ *adj* (1880) : free from inhibition; *also* : boisterously informal — **un·in·hib·it·ed·ly** *adv* — **un·in·hib·it·ed·ness** *n*
un·ini·tiate \ˌən-ə-'ni-sh(ē-)ət\ *adj* (1801) : not initiated : INEXPERIENCED — **uninitiate** *n*
un·in·ter·est \ˌən-'in-trəst, -'in-tə-ˌrest, -tə-ˌrest, -tərst, -'in-ˌtrest\ *n* (1890) : lack of interest
uninterested *adj* (1661) : not interested : not having the mind or feelings engaged *usage* see DISINTERESTED
uni·nu·cle·ate \ˌyü-ni-'nü-klē-ət, -'nyü-\ *adj* (1885) : having a single nucleus ⟨a ∼ yeast cell⟩
[1]**union** \'yün-yən\ *n* [ME, fr. MF, fr. LL *union-, unio* oneness, union, fr. L *unus* one — more at ONE] (15c) **1 a** : an act or instance of uniting or joining two or more things into one: as (1) : the formation of a single political unit from two or more separate and independent units (2) : a uniting in marriage; *also* : SEXUAL INTERCOURSE (3) : the growing together of severed parts **b** : a unified condition : COMBINATION, JUNCTION ⟨a gracious ∼ of excellence and strength⟩ **2** : something that is made one : something formed by a combining or coalition of parts or members: as **a** : a confederation of independent individuals (as nations or persons) for some common purpose **b** (1) : a political unit constituting an organic whole formed usu. from previously independent units (as England and Scotland in 1707) which have surrendered their principal powers to the government of the whole or to a newly created government (as the U.S. in 1789) (2) *cap* : the federal union of states during the period of the U.S. Civil War **c** *cap* : an organization on a college or university campus providing recreational, social, cultural, and sometimes dining facilities; *also* : the building housing such an organization **d** : the set of all elements belonging to one or more of a given collection of two or more sets — called also *join, sum* **e** : LABOR UNION **3 a** : a device emblematic of the union of two or more sovereignties borne on a national flag typically in the upper inner corner or constituting the whole design of the flag **b** : the upper inner corner of a flag **4** : any of various devices for connecting parts (as of a machine); *esp* : a coupling for pipes or pipes and fittings
[2]**union** *adj* (1707) : of, relating to, dealing with, or constituting a union; *esp, cap* : of, relating to, or being the side favoring the Union in the U.S. Civil War ⟨*Union* troops⟩
union card *n* (1874) **1** : a card certifying personal membership in good standing in a labor union **2** : something that resembles a union card esp. in being necessary for employment or in providing evidence of ingroup status
union church *n* (1847) : a local church uniting members of diverse denominational backgrounds in an interdenominational congregation
un·ion·i·sa·tion, union·ise *Brit var of* UNIONIZATION, UNIONIZE
union·ism \'yün-yə-ˌni-zəm\ *n* (1845) : the principle or policy of forming or adhering to a union: as **a** *cap* : adherence to the policy of a firm federal union between the states of the United States esp. during the Civil War period **b** : the principles, theory, advocacy, or system of trade unions
union·ist \-nist\ *n* (1799) : an advocate or supporter of union or unionism
union·i·za·tion \ˌyün-yə-nə-'zā-shən\ *n* (1896) **1** : the quality or state of being unionized **2** : the action of unionizing
union·ize \'yün-yə-ˌnīz\ *vb* **-ized; -iz·ing** *vt* (1890) : to organize into a labor union ∼ *vi* : to form or join a labor union
unionized *adj* (1900) : characterized by the presence of labor unions ⟨∼ states⟩
union jack *n* (1674) **1** : a jack consisting of the union of a national ensign **2** *cap U&J* : the state flag of the United Kingdom consisting of the union of the British national ensign
union shop *n* (1904) : an establishment in which the employer by agreement is free to hire nonmembers as well as members of the union but retains nonmembers on the payroll only on condition of their becoming members of the union within a specified time
union suit *n* (1892) : an undergarment with shirt and drawers in one piece


union suit

uni·pa·ren·tal \ˌyü-ni-pə-'ren-tᵊl\ *adj* (1900) : having or involving a single parent; *esp* : PARTHENOGENETIC — **uni·pa·ren·tal·ly** \-tᵊl-ē\ *adv*
unique \yü-'nēk\ *adj* [F, fr. L *unicus*, fr. *unus* one — more at ONE] (1602) **1** : being the only one : SOLE ⟨his ∼ concern was his own comfort⟩ ⟨I can't walk away with a ∼ copy. Suppose I lost it? —Kingsley Amis⟩ ⟨the ∼ factorization of a number into prime factors⟩ **2 a** : being without a like or equal : UNEQUALED ⟨could stare at the flames, each one new, violent, ∼ —Robert Coover⟩ **b** : distinctively characteristic : PECULIAR 1 ⟨this is not a condition ∼ to California —Ronald Reagan⟩ **3** : UNUSUAL ⟨a very ∼ ball-point pen⟩ ⟨we were fairly ∼, the sixty of us, in that there wasn't one good mixer in the bunch —J. D. Salinger⟩ *syn* see STRANGE — **unique·ly** *adv* — **unique·ness** *n*
usage Many commentators have objected to the comparison or modification (as by *somewhat* or *very*) of *unique;* the statement that a thing is either unique or it is not has often been repeated by them. Objections are based chiefly on the assumption that *unique* has but a single absolute sense, an assumption contradicted by information readily available in a dictionary. *Unique* dates back to the 17th century but was little used until the end of the 18th when, according to the Oxford English Dictionary, it was reacquired from French. H. J. Todd entered it as a foreign word in his edition (1818) of Johnson's Dictionary, characterizing it as "affected and useless." Around the middle of the 19th century it ceased to be considered foreign and came in for considerable popular use. With popular use came a broadening of connotation beyond the original two meanings (here numbered 1 and 2a) in modern use both comparison and modification are widespread and standard but are confined to the extended senses 2b and 3. When sense 1 or sense 2a is intended, *unique* is used without qualifying modifiers.
[1]**uni·sex** \'yü-nə-ˌseks\ *n* (1966) : the state or condition of not being distinguishable (as by hair or clothing) as to sex
[2]**unisex** *adj* (1968) **1** : not distinguishable as male or female (as by hair or clothes) **2** : suitable or designed for both males and females ⟨∼ clothes⟩
uni·sex·u·al \ˌyü-nə-'sek-sh(ə-)wəl, -shəl\ *adj* (ca. 1802) **1** : of, relating to, or restricted to one sex: **a** : male or female but not hermaphroditic **b** : DICLINOUS ⟨a ∼ flower⟩ **2** : UNISEX — **uni·sex·u·al·i·ty** \-ˌsek-shə-'wa-lə-tē\ *n*
uni·son \'yü-nə-sən, -nə-zən\ *n* [MF, fr. ML *unisonus* having the same sound, fr. L *uni-* + *sonus* sound — more at SOUND] (1575) **1** : identity in musical pitch; *specif* : the interval of a perfect prime **b** : the state of being so tuned or sounded **c** : the writing, playing, or singing of parts in a musical passage at the same pitch or in octaves **2** : a harmonious agreement or union : CONCORD — **unison** *adj* — **in unison** : in perfect agreement : so as to harmonize exactly **2** : at the same time : SIMULTANEOUSLY
[1]**unit** \'yü-nət\ *n* [back-formation fr. *unity*] (1570) **1 a** : the first and least natural number : ONE **b** : a single quantity regarded as a whole in calculation **2** : a determinate quantity (as of length, time, heat, or value) adopted as a standard of measurement: as **a** : an amount of work used in education in calculating student credits **b** : an amount of a biologically active agent (as a drug or antigen) required to produce a specific result under strictly controlled conditions **3 a** : a single thing, person, or group that is a constituent of a whole **b** : a part of a military establishment that has a prescribed organization (as of personnel and materiel) **c** : a piece or complex of apparatus serving to perform one particular function **d** : a part of a school course focusing on a central theme **e** : a local congregation of Jehovah's Witnesses
[2]**unit** *adj* (1844) : being, relating to, or measuring one unit
unit·age \'yü-nə-tij\ *n* (1935) **1** : specifications of the amount constituting a unit **2** : amount in units
uni·tard \'yü-nə-ˌtärd\ *n* [*uni-* + leo*tard*] (1961) : a close-fitting one-piece garment for the torso, legs, and feet, and often for the arms
uni·tar·i·an \ˌyü-nə-'ter-ē-ən\ *n* [NL *unitarius*, fr. L *unitas* unity] (1687) **1 a** *often cap* : one who believes that the deity exists only in one person **b** *cap* : a member of a denomination that stresses individual freedom of belief, the free use of reason in religion, a united world community, and liberal social action **2** : an advocate of unity or a unitary system — **unitarian** *adj, often cap* — **uni·tar·i·an·ism** \-ē-ə-ˌni-zəm\ *n, often cap*
uni·tary \'yü-nə-ˌter-ē\ *adj* (1861) **1 a** : of or relating to a unit **b** : based on or characterized by unity or units **2** : having the character of a unit : UNDIVIDED, WHOLE — **uni·tar·i·ly** \ˌyü-nə-'ter-ə-lē\ *adv*
unit cell *n* (1915) : the simplest polyhedron that embodies all the structural characteristics of and by indefinite repetition makes up the lattice of a crystal
unit character *n* (1902) : a natural character inherited on an all-or-none basis; *esp* : one dependent on the presence or absence of a single gene
unit circle *n* (1955) : a circle having a radius of 1
[1]**unite** \yü-'nīt\ *vb* **unit·ed; unit·ing** [ME, fr. L *unire*, fr. *unus* one — more at ONE] *vt* (15c) **1 a** : to put together to form a single unit **b** : to cause to adhere **c** : to link by a legal or moral bond **2** : to possess (as qualities) in combination ∼ *vi* **1 a** : to become one or as if one **b** : to become combined by or as if by adhesion or mixture **2** : to act in concert *syn* see JOIN — **unit·er** *n*
[2]**unite** \'yü-ˌnīt\ *n* [obs. *unite* united, fr. ME *unit*, fr. LL *unitus*, pp.] (1604) : an old British gold 20-shilling piece issued first by James I in 1604 for the newly united England and Scotland — called also *Jacobus*
unit·ed \yü-'nī-təd\ *adj* (1552) **1** : made one : COMBINED **2** : relating to or produced by joint action **3** : being in agreement : HARMONIOUS — **unit·ed·ly** *adv*
United Nations Day *n* (1947) : October 24 observed in commemoration of the founding of the United Nations
United States \yü-'nī-təd-, *esp Southern* 'yü-ˌ\ *n pl but sing or pl in constr* (1617) : a federation of states esp. when forming a nation in a usu. specified territory ⟨advocating a *United States* of Europe⟩
uni·tive \'yü-nə-tiv, yü-'nī-\ *adj* (1526) : characterized by or tending to produce union
unit·ize \'yü-nə-ˌtīz\ *vt* **-ized; -iz·ing** (1860) **1** : to form or convert into a unit **2** : to divide into units ⟨the added cost of *unitizing* bulk products⟩ — **unit·i·za·tion** \ˌyü-nə-tə-'zā-shən\ *n*
unit membrane *n* [fr. its being the basic structural unit of the cell] (1959) : a 3-layered membrane that consists of an inner lipid layer surrounded by a protein layer on each side
unit rule *n* (1884) : a rule under which a delegation to a national political convention casts its entire vote as a unit as determined by a majority vote
uni·trust \'yü-ni-ˌtrəst\ *n* (1970) : a trust from which the beneficiary receives annually a fixed percentage of the fair market value of its assets
units place *n* (1937) : the place just to the left of the decimal point in a number expressed in the Arabic system of writing numbers
unit train *n* (1964) : a railway train that transports a single commodity directly from producer to consumer
unit trust *n* (1936) **1** *Brit* : MUTUAL FUND **2** : an investment company whose portfolio consists of long-term bonds that are held to maturity
uni·ty \'yü-nə-tē\ *n, pl* **-ties** [ME *unite*, fr. MF *unité*, fr. L *unitat-, unitas*, fr. *unus* one — more at ONE] (14c) **1 a** : the quality or state of not being multiple : ONENESS **b** (1) : a definite amount taken as one or for which 1 is made to stand in calculation ⟨in a table of natural sines the radius of the circle is regarded as ∼⟩ (2) : IDENTITY ELEMENT **2 a** : a condition of harmony : ACCORD **b** : continuity without deviation or change (as in purpose or action) **3 a** : the quality or state of being made one : UNIFICATION **b** : a combination or ordering of parts in a literary or artistic production that constitutes a whole or promotes an